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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/534,035	05/06/2005	Shing-Tung Yau	050106	9738
44920	7590	10/14/2008	EXAMINER	
Venable LLP			KIM, CHONO R	
Raymond J. Ho				
575 7th Street NW			ART UNIT	PAPER NUMBER
Washington, DC 20004-1601			2624	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/534,035	Applicant(s) YAU ET AL.
	Examiner CHARLES KIM	Art Unit 2624

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
 - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
 - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED. (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(o).

Status

- 1) Responsive to communication(s) filed on 18 August 2008.
- 2a) This action is FINAL. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 134-159 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 134-159 is/are rejected.
- 7) Claim(s) _____ is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on 06 May 2005 is/are: a) accepted or b) objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) Notice of References Cited (PTO-892)
 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
 3) Information Disclosure Statement(s) (PTO/1648)
 Paper No(s)/Mail Date 4/21/08
- 4) Interview Summary (PTO-413)
 Paper No(s)/Mail Date. _____
- 5) Notice of Informal Patent Application
- 6) Other: _____

DETAILED ACTION

Requirement for Information

1. Applicant and the assignee of this application are required under 37 CFR 1.105 to provide the following information that the examiner has determined is reasonably necessary to the examination of this application.

In response to this requirement, please provide copies of each publication which any of the applicants authored or co-authored and which describe the disclosed subject matter of conformal mapping comprising either the steps of forming a doubling mesh or determining a holomorphic 1-form basis of a mesh representation.

In addition, please provide the title, citation and copy of each publication that any of the applicants relied upon to develop the disclosed subject matter that describes the applicant's invention, particularly as to developing the steps of forming a doubling mesh and the steps of determining a holomorphic 1-form basis of a mesh representation. For each publication, please provide a concise explanation of the reliance placed on that publication in the development of the disclosed subject matter.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

2. Claim(s) 134-159 is/are rejected under 35 U.S.C. 101 as not falling within one of the four statutory categories of invention. While the claims recite a series of steps or acts to be

performed, a statutory “process” under 35 U.S.C. 101 must (1) be tied to another statutory category (such as a manufacture or machine), or (2) transform underlying subject matter (such as an article or material) to a different state or thing (Reference the May 15, 2008 memorandum issued by Deputy Commissioner for Patent Examining Policy, John J. Love, titled “Clarification of ‘Processes’ under 35 U.S.C. 101”)¹. The instant claims neither transform underlying subject matter nor positively recite structure associated with another statutory category, and therefore do not define a statutory process.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claim 134 is rejected under 35 U.S.C. 102(a) as being anticipated by the article “Geometry Images” by Gu et al., (hereinafter “Gu”).

Referring to claim 134, Gu discloses a method of analysis of a geometric surface, the method comprising:

determining a conformal structure of a mesh representation of the surface [p. 355, abstract and section 1]; and

¹ See http://www.uspto.gov/web/offices/pac/dapp/opla/preognitice/section_101_05_15_2008.pdf

using the conformal structure to conformally map the surface representation to a canonical parameter domain [p. 356, section 3].

4. Claims 134, 154, 156 are rejected under 35 U.S.C. 102(a) as being anticipated by the article “Least Squares Conformal Maps for Automatic Texture Atlas Generation” by Levy et al., (hereinafter “Levy”).

Referring to claim 134, Levy discloses a method of analysis of a geometric surface, the method comprising:

determining a conformal structure of a mesh representation of the surface [sections 1-A.5, particularly section 2]; and

using the conformal structure to conformally map the surface representation to a canonical parameter domain [sections 1-A.5, particularly section 2].

Referring to claim 154, Levy further discloses determining a period matrix of the surface from the surface representation, wherein the period matrix is a complete invariant of the conformal structure [sections 1-A.5, particularly section A.3].

Referring to claim 156, Levy further discloses that the surface is an open, genus zero surface with a single boundary, referred to as a topological disk, and wherein the canonical parameter domain is a canonical planar disk [sections 1-A.5, also abstract].

5. Claims 134 and 155 are rejected under 35 U.S.C. 102(b) as being anticipated by the article "Conformal Surface Parameterization for Texture Mapping" by Haker et al., (hereinafter "Haker").

Referring to claim 134, Haker discloses a method of analysis of a geometric surface, the method comprising:

determining a conformal structure of a mesh representation of the surface [pp. 181-184, sections 1-3]; and

using the conformal structure to conformally map the surface representation to a canonical parameter domain [pp. 181-184, sections 1-3].

Referring to claim 155, Haker further discloses that the surface is a closed, genus zero surface, and wherein the canonical domain is a sphere [pp. 181-184, sections 1-3].

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claim 135 is rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Gu and Doak et al., U.S. Patent Application No. 2003/0058238 (hereinafter "Doak").

Referring to claim 135, Gu does not explicitly disclose that if the surface is open, transforming a representation corresponding to the open surface into a representation corresponding to a closed surface. However, this feature was exceedingly well known in the art.

For example, Doak discloses that if the surface is open, a representation corresponding to the open surface is transformed into a representation corresponding to a closed surface [par. 66].

Gu and Doak are combinable because they are both concerned with analyzing geometric surfaces. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to modify Gu in view of Doak. The reason for doing so would have been to enhance the accuracy of the mesh representation of the surface by closing all the opened surfaces. Therefore, it would have been obvious to combine Gu with Doak to obtain the invention as specified in claim 135.

7. Claims 158-159 rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Levy and Krishnamurthy, U.S. Patent No. 6,256,039 (hereinafter “Krishnamurthy”).

Referring to claims 158-159, Levy does not explicitly disclose that the canonical parameter domain is a Euclidian plane. However, this feature was exceedingly well known in the art. For example, Krishnamurthy discloses a geometric surface that is mapped to a canonical parameter domain comprising the Euclidian plane [col. 5, ll. 28-36].

Levy and Krishnamurthy are combinable because they are both concerned with analyzing geometric surfaces. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to modify Levy in view of Krishnamurthy. The reason for doing so would have been to enhance the ability to manipulate the mesh representation of the surface [Krishnamurthy, col. 3, ll. 33-35]. Therefore, it would have been obvious to combine Levy with Krishnamurthy to obtain the invention as specified in claims 158-159.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Charles Kim whose telephone number is 571-272-7421. The examiner can normally be reached on Mon thru Thurs 8:30am to 6pm and alternating Fri 9:30am to 6pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bhavesh Mehta can be reached on 571-272-7453. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/CHARLES KIM/
Primary Examiner
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October 8, 2008